

## CLAIMS

What is claimed is:

1. A eukaryotic cell comprising:

a first recombinant gene encoding a chimeric receptor;

a second recombinant gene encoding a compound the expression of which creates an autocrine or anti-autocrine loop; and

a reporter system that is activated or inactivated upon the creation of said autocrine or anti-autocrine loop.

2. The eukaryotic cell of claim 1 wherein the cell is any eukaryotic cell other than yeast.

3. The eukaryotic cell of claim 1 or 2 wherein the chimeric receptor is a multimeric or multimerizing receptor.

4. The eukaryotic cell of claim 1, claim 2, or claim 3, wherein said second recombinant gene is functionally incorporated after a constitutive promoter.

5. The eukaryotic cell of any one of claims 1 through 4 wherein said reporter system is activated as a result of a ligand binding to said chimeric receptor.

6. The eukaryotic cell of claim 1 wherein a cytoplasmic part of the chimeric receptor is a cytoplasmic part of one of at least one interferon receptor subunit.

7. The eukaryotic cell of claim 1 wherein the reporter system comprises *E. coli* xanthine-guanine phosphoribosyl transferase (gpt).

8. The eukaryotic cell of claim 6 wherein said reporter system is placed under control of a 6-16 promoter.

*Sub A2*

9. The eukaryotic cell of claim 4 wherein said second recombinant gene is inserted after an SRa or HEF1a promoter.

10. The eukaryotic cell of claim 1 wherein the cell is a 2fTGH cell.

11. A method of screening for compounds that interfere with the binding of a ligand with the extracellular part of a chimeric receptor and/or with the signaling pathway of the cytoplasmic part of a chimeric receptor, the method comprising:

providing the eukaryotic cell of any one of claims 1 through 10;

reacting a series of compounds with said eukaryotic cell; and

determining the activity of each element of said series of compounds.

12. A method of screening for orphan receptors and for unknown ligands, said method comprising:

transforming an eukaryotic host cell with a gene encoding a chimeric receptor;

transforming said eukaryotic host cell with a gene encoding a reporter system inducible by a ligand's binding to said chimeric receptor;

transforming said host cell with a gene encoding for a ligand of said chimeric receptor; and selecting for cells in which the reporter system is activated or inactivated.

13. A method for screening compounds that interfere with the binding of a ligand to a receptor and/or with the signaling pathway of a receptor, said method comprising:

transforming a eukaryotic host cell with a gene encoding a chimeric receptor;

transforming said host cell with a reporter system inducible by a ligand's binding to said chimeric receptor;

transforming said host cell with a gene encoding an inhibitor of the ligand binding to said chimeric receptor;

transforming said host cell with a gene encoding a ligand for said chimeric receptor and/or supplying said ligand to the host cell; and

selecting for cells in which the reporter system is activated or inactivated.

*Sub A3*

14. A kit, comprising a eukaryotic host cell and one or more transformation vectors, which upon the transfection of said cell with said vector or vectors, results in the eukaryotic cell of any one of claim 1 through 10.

*Sub C3*

15. A method of screening for orphan receptors and unknown ligands comprising:  
providing a eukaryotic cell comprising:  
    a first recombinant gene encoding a chimeric receptor;  
    a second recombinant gene encoding a compound, the expression of which creates an autocrine or anti-autocrine loop;  
    a reporter system that is activated or inactivated upon the creation of said autocrine or anti-autocrine loop;  
reacting a series of compounds with said eukaryotic cell;  
assaying the activity of each element of said series of compounds; and  
based on said assaying, determining the presence or absence of orphan receptors and unknown ligands.

16. The method according to claim 15 wherein said series of compounds comprise genes encoding candidate inhibitors.

17. The method according to claim 16 wherein said inhibitors create an autocrine or anti-autocrine loop.

18. The method according to claim 15 wherein said unknown ligands are produced by an autocrine or anti-autocrine loop.

19. The method according to claims 15 wherein said orphan receptors may be mutated and/or genetically modified to a form that constitutively initiates the signaling pathway.

20. A pharmaceutical composition comprising the eukaryotic cell of claim 1.

*Add B*

*Add DS*